920476-907469

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of	:	Anslow, Peter J.
Serial No.	:	09/973,650
Filed	:	09 October, 2001
For	:	Distortion measurement in Optical Communication Systems
Confirmation No.	:	6193
Examiner	:	Payne, David C
Art Unit	:	2613
Customer number	:	23644

REPLY BRIEF

Honorable Director of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This reply brief is in reply to the Examiner's answer mailed on June 14, 2007 which replaces the earlier Examiner's Answer mailed November 3, 2006. While the current Examiner's Answer embellishes on the grounds of rejection, the response to the arguments of the applicants has not been changed, and therefore the substance of this Reply Brief has not been changed.

(3) Status of Claims

The revised status of claims is agreed, though for the record, as the interview was only after the appeal brief was filed, and claim 9 was only rejected afterwards, that brief was not incorrect.

(10) Response to Arguments

The Examiner has not denied any of the detailed explanation in the appeal brief setting out why Taga only shows measuring Q on signals subject to distortion, and that this cannot involve measuring the amplitude distortion component when there is also a noise component. However it is not clear whether the Examiner has understood this explanation, as the Examiner summarises it inaccurately by saying the Applicant claims that "noise and amplitude distortion components" is somehow different from Taga.

The Examiner goes on to say that the point is not that Taga shows measuring the combination of amplitude distortion and noise, (we did not say that in the appeal brief, we said that the claim can only be interpreted as measuring them separately, and Taga does not show this). Furthermore, what the Examiner tries to explain as being "the point", seems to be based on a fundamental misunderstanding of the invention claimed. The misunderstanding may hinge on what is meant by the claim term "amplitude distortion component". As the Examiner has still not explained exactly what he regards as the meaning or scope of this term, we are left to try to deduce the Examiners interpretation. It seems the Examiner has used several inconsistent interpretations, all of which are unreasonable interpretations, as will be explained below. Any reasonable interpretation of this claim term confirms that the rejection of the claims over Taga is unsupportable.

Claim 1 explicitly specifies "determining the amplitude distortion component" in a signal "subject to noise and amplitude distortion components". We explained in detail in the appeal brief that Taga cannot do this. The Examiner has not directly denied any of this explanation, but says at page 4 of the response that "The point" is that:

" by measuring Q values one inherently measures an amplitude component."

This is an extraordinary statement. Claim 1 does not mention or relate to an "amplitude component", so why should measuring an "amplitude component" be of any relevance to a claim concerned with measuring an "amplitude distortion component"? "Amplitude component" is not limited to distortion and so would encompass any amplitude component, which presumably can include a desired amplitude modulation pulse for carrying information. The Examiner provides no explanation of why measuring an amplitude modulation component is at all relevant, let alone the "point" at the heart of an anticipation or obviousness argument, so we are left to try to deduce how this statement is relevant or contributes to the claim rejection.

If we try to read the Examiner's references to "amplitude component" as a simple mistake or a shorthand for "amplitude distortion component" this is inconsistent with the passage later in the same page of the response where the Examiner says "mean signal level to one of ordinary skill in the art is taken to be equivalent to an amplitude component". Clearly a mean signal level can be an amplitude component but cannot be an example of an amplitude distortion component, since it is unknown how much of the mean signal level is made up of a desired amplitude pulse component, and how much is a distortion component.

Hence this passage suggests that the Examiner regards an "amplitude component" as the same as an "amplitude distortion component". But as this interpretation of "amplitude distortion component" cannot possibly be correct. we hesitate to conclude that this is what the Examiner is relying on.

But at the end of page 4 of the response, the Examiner refers to "another reference to show the inherent nature of amplitude measurement in Q values". This seems to confirm the Examiner does indeed intend to refer to a disclosure of amplitude measurement generally as being somehow relevant to measurement of amplitude distortion. Then in page 5 the Examiner states that "when measuring Q values in an optical system one is naturally measuring amplitude distortion and hence noise". In this passage, the Examiner seems to equate amplitude distortion to noise, suggesting the Examiner is interpreting the claimed amplitude distortion component as meaning the same as the noise component. This is also incorrect as

has been explained before, and seems completely inconsistent with the position that "amplitude distortion component" is to be interpreted as "amplitude component".

In any case, these references cited by the Examiner only confirm what was stated in the appeal brief that Q measurements involve determining a ratio of eye opening (difference between average levels) to noise (standard deviation of levels). For the Examiner to continue to argue that this inherently involves measuring an "amplitude distortion component", then it follows that he must consider the claim term "amplitude distortion component" as encompassing one or more of these components of the Q measurement. That means the Examiner seems to be interpreting amplitude distortion as meaning the average levels, or differences between these average levels, or as meaning the noise.

But none of these are reasonable interpretations, as will be explained in more detail.

<u>"Amplitude distortion" cannot be interpreted as "noise"</u>

Amplitude distortion as used in the claim cannot be interpreted to be the same as noise because the claim would not make sense. Claim 1 specifies measuring the amplitude distortion component in an optical transmission signal subject to noise and amplitude distortion components. If amplitude distortion meant the same as noise, the claim would read "measuring the noise in a signal subject to noise and noise", which is nonsense. As well as being nonsense, such an interpretation would also be contrary to the specification, which consistently makes it clear that amplitude distortion is not the same as noise. For example, at page 2 lines 23-25 "One of the key requirements of the network is to assess what is happening to the signal, for example, whether factors such as the levels of noise, distortion, power etc are within expected limits.". See also page 4 lines 24-25 "However, when distortion is present as well as noise, e.g . through cross-talk or pulse "smearing" due to dispersion, the result is..."

So this cannot be a reasonable interpretation of the claim term "amplitude distortion component".

"Amplitude distortion component" cannot be interpreted as "amplitude component"

This extraordinary interpretation completely ignores the word "distortion", and is completely inconsistent with the rest of the claim and with the disclosure of the specification. Nowhere is there any justification for treating this word as an optional feature of the claim. It would change the nature of the invention completely to measure an amplitude component in a signal having the amplitude component and noise, without measuring a distortion component. This would be contrary to the specification, which consistently refers to measuring distortion, for example see the passage at page 6 lines 3 to 5 "changes in the bit error ratio of the received signal analysed according to the present method can be differentiated as between noise-induced changes and distortion-induced changes."

"Amplitude distortion component" cannot be interpreted as "average levels"

As mentioned above, an average level, or a mean signal level, gives no information as to how much of the mean signal level is made up of a desired amplitude component, and how much is a distortion component. Average levels do tend to remove effects of random noise, but do tend to include non random distortions, together with the desired amplitude level. But there is no way of knowing what is the proportion of distortion, and what is the proportion of desired amplitude component, in averaged amplitude measurements, used to determine Q factors. So such average levels cannot give a measurement of amplitude distortion, though as explained in the appeal brief, they can give an indication of an amount of random noise. Hence if amplitude distortion cannot be ignored, as explained above, then this claim term cannot be interpreted as encompassing an average level.

"Amplitude distortion component" cannot be interpreted as "difference of average levels"

The difference of levels refers to levels at the top and bottom of a pulse carrying information. So the difference of levels corresponds to the pulse amplitude, but again this amplitude will have a component of desired pulse amplitude and a component of amplitude distortion, and so if distortion cannot be ignored, as explained above, then this claim term cannot be interpreted as encompassing a difference of average levels.

Correct interpretation of "amplitude distortion component"

In view of the above, since amplitude distortion cannot mean the same as noise, the only reasonable interpretation for a skilled person is that an amplitude distortion component in an optical transmission system refers to a distortion component other than random noise, in other words distortion caused by factors of the system having non random, or deterministic effects on the desired signal, such as dispersion or self phase modulation for example, in contrast to noise which is by definition random and non deterministic.

This is the normal usage that a skilled person would use for these terms in the context of optical transmission systems. This interpretation is entirely consistent with the rest of the claim, and with the specification.

The difference over Taga

This leads inevitably to the conclusion that only if an unreasonable interpretation of amplitude distortion is used, can it be argued that Taga shows inherently measuring amplitude distortion. Once a correct, reasonable interpretation of the claim feature of "measuring the amplitude distortion component in an optical transmission signal subject to noise and amplitude distortion components..." has been established, it becomes clear that Taga cannot show or suggest this feature.

As has been explained before, Taga shows a Q measurement which provides a value which can be regarded as representing the ratio of the eye opening to the noise. It cannot provide a value of the eye opening itself. So the Q measurement in Taga is a form of signal to noise ratio, but provides no information about any amplitude distortion component. It was acknowledged in the appeal brief that Taga measures Q on signals subject to distortion. But since Taga fails to show determining an amplitude distortion component separately from the noise component, it cannot "inherently" measure amplitude distortion as claimed.

Reversal of the Examiner's rejections is respectfully requested.

June 21, 2007

Respectfully submitted,

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